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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/634,175	08/04/2003	Koji Yamamoto	SHIGE1.001DV1	7123

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EXAMINER

DUONG, THO V

ART UNIT	PAPER NUMBER
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3743

DATE MAILED: 05/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/634,175	YAMAMOTO ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Tho v Duong	3743	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 04 August 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Specification*

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract of the disclosure is objected to because the legal phraseology such as “means”, “said”, “comprising” or “comprises” often used in patent claims should be avoided in the abstract .

The abstract of the disclosure is objected to because the abstract uses the legal phraseology “comprises”. Correction is required. See MPEP § 608.01(b).

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 3 are rejected under 35 U.S.C. 102(b) as being anticipated by Hinako et al. (JP 410258307A). Hinako et al. discloses (figures 1,3 and paragraphs 10-12) a method of manufacturing an internal grooved tube comprising the step of inserting a grooved plug (2) having a large number of fine spiral grooves on the outside surface into a blank tube (3) rotatably; and pressing the peripheral wall of the blank of the blank tube against the outside surface of the grooved plug with two or more than two balls (1) revolving both around the circumference of the blank tube and on its axis in a location of the grooved plug (2) inserted,

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while drawing out the blank tube (3) longitudinal in one direction; and the direction of revolution of the balls (1) is allowed to match the direction of rotation of the grooved plug (arrow 9a).

Claims 5-10 are rejected under 35 U.S.C. 102(e) as being anticipated by Robinson et al. (US 6,164,370). Robinson discloses (figures 7 and 8) an internal grooves tube comprising a large number of fine spiral grooves (120) formed on an inside surface in parallel arrangement. Robinson further discloses (Table 1) the claimed ratio of a groove width in axial direction ( $W_{axial}$ ) to a groove height (H). Specifically, tube 13 has a ratio of groove height (H) to cross-section width ( $W_{cross}$ ) is 1.670 and the helix angle ( $\alpha$ ) is 22.7. The claimed ratio of  $W_{axial}/H$  can also be presented in formula (1):

$$W_{axial} = W_{cross} / \tan(\alpha) \Rightarrow W_{axial}/H = W_{cross} / (\tan(\alpha) * H) \quad (1)$$

The ratio of  $W_{cross}/H$  is already known and being equal to 1/1.670 and helix angle ( $\alpha$ ) is 22.7 degrees.

Therefore, the  $W_{axial}/H$  is equal to 1.43, which is within the claimed range of 1-2. Robinson further discloses (column 7, lines 61-63) that the helix angle ( $\alpha$ ) can be varied from 10 to 30 degrees. As regarding the limitations of "by inserting a grooved plug...while drawing out the blank tube longitudinally in one direction" and "the direction of revolution of the balls is allowed to match the direction of rotation of the grooved plug", the method of forming the device is not germane to the issue of patentability of the device itself. "Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different

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process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). (MPEP 2114).

In this case, the internal grooved tube as claimed is the same as the internal grooved tube of Robinson. Therefore, claims 5-10 are unpatentable even though the prior product was made by a different process.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hinako et al. in view of Onishi et al. (US 4,545,428). Hinako substantially discloses all of applicant's claimed invention as discussed above except for the limitation that a lead angle of the grooves of the grooved plug to the axis is limited to 26 to 45 degrees. Hinako further discloses that the grooved plug (2) imprints the shape of grooves of the grooved plug to the inner surface of the tube. Therefore, the lead angle of the grooves of the grooved plug and of the inner surface of the tube are the same. However, Hinako is silent about the lead angle of the grooves on the grooved plug. Onishi et al. discloses (figure 5 and column 6, lines 13-34) an internal grooved tube (1) having a large number of grooves (8) on the inner surface of the tube wherein the lead angle () of the grooves to the axis is between 16 to 35 degrees for the purpose of improving the refrigerant side heat transfer coefficient of the heat transfer tube. Since Hinako and Onishi are both from the same field of endeavor and/or analogous art, the purpose disclosed by Onishi would have been recognized in the pertinent art of Hinako. It would have been obvious to one having ordinary

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skill in the art at the time the invention was made to have the lead angle of the grooves on the grooved plug to obtain the lead angle of grooves on the tube ranged between 26 to 45 degrees for the purpose of improving the refrigerant heat transfer coefficient of the heat transfer tube.

***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Tatsumi et al. (US 4,373,366) discloses machine for forming spiral grooves in metal pipe inner surface.

Hinako et al. (JP 410296369A) discloses a method for working internally grooved tube.

Any inquiry concerning this communication or earlier communication from the examiner should be directed to Tho Duong whose telephone number is (703) 305-0768. The examiner can normally be reached on from 9:30-6 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Henry Bennet, can be reached on (703) 308-0101. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0861.



TD

May 7, 2004



Tho Duong

Patent Examiner.